

ABSTRACT

An electrospray device includes a high voltage electrode chamber. The high voltage electrode chamber includes an inlet for receiving a fluid to be ionized and for directing the fluid into the chamber and at least one electrode having an exposed surface within the chamber. A flow channel directs fluid over a surface of the electrode and out of the chamber. The length of the flow channel over the electrode is greater than the height of the flow channel over the electrode, thereby producing enhanced mass transport to the working electrode resulting in improved electrolysis efficiency. An outlet is provided for transmitting the fluid out from the electrode chamber. A method of creating charged droplets includes flowing a fluid over an electrode where the length over the electrode is greater than the height of the fluid flowing over the electrode.